

Appln No. 09/647,899
Amdt date July 28, 2003
Reply to Office action of March, 26, 2003

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

C1 *Sp* *Rack*

1. (Currently Amended) A drive for adjusting devices in motor vehicles comprising:
one of a fixed spindle and a fixed toothed rack fixed on one of two relatively displaceable parts;
a gear assembly mounted on the other of the two relatively displaceable parts; and
a gear housing holding the gear assembly, with the gear housing having at least two housing plates which can be fixed against each other by plug-in connectors;
each plug-in connector comprising a plug at one of the at least two housing plates and a receptacle for the plug at the other of the at least two housing plates, and [the] each plug-in connector is connected by plugging the plug into [the] a respective one of the receptacles;
wherein the plug-in connectors are formed sufficiently rigid to fix the at least two housing plates relative to each other in all three-dimensional directions and [thereby] to form supporting connecting joints which absorb [the] gear forces, and
wherein the at least two housing plates are fixed relative to each other solely at the plug-in connections.
2. (Canceled)
3. (Currently Amended) The drive according to claim 1 [or 2], wherein the gear housing has two L-shaped housing plates.
4. (Currently Amended) The drive according to claim 1 [or 2], wherein the at least two housing plates comprise[s] at least two pairs of opposing disc-shaped [like] housing plates.

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E 1 Sub Contd
5. (Currently Amended) The drive according to claim 1 [or-2], wherein the gear housing has a U-shaped housing plate and a disc-shaped [like] housing plate.

6. (Previously Amended) The drive according to claim 1, wherein for each of the plug-in connectors, the plug comprises a raised area extending along the plane of one of the at least two housing plates and the receptacle comprises an associated recess extending transversely to the plane of the one of the at least two housing plates.

7. The drive according to claim 6, wherein the recess is a through opening.

8. The drive according to claim 6, wherein the raised area is a web.

9. The drive according to claim 6, wherein the raised area has two surfaces which are parallel to each other in the assembly direction and the associated recess has two surfaces which are parallel in the assembly direction.

10. The drive according to claim 6, wherein the raised area has surfaces running conical in the assembly direction and the associated recess has surfaces which are parallel in the assembly direction so that a press fit is achieved during assembly.

11. (Previously Amended) The drive according to claim 6, wherein the housing plates are fixed by plastic deformation of the material in the area of the plug-in connectors.

12. The drive according to claim 1, wherein the housing plates are made from one of sintered material, cast material, steel and plastics.

13. The drive according to claim 1 further comprising bearing points for the gear assembly, at least a part of which are integrated in the at least two housing plates.

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14. The drive according to claim 1, wherein the spindle is a threaded spindle and the gear assembly includes a spindle nut with external worm wheel teeth and a drive worm engaging therewith.

15. The drive according to claim 1, wherein the gear assembly includes a worm with a worm wheel and a drive worm, the worm lying on an axis with the worm wheel and fixedly connected to same.

16. (Previously Amended) The drive according to claim 1, wherein the two relatively displaceable parts are a bottom rail and a top rail of a box-profile type guide rail assembly, the guide rail assembly having a hollow cavity; and

wherein the one of the fixed spindle and the fixed toothed rack is a spindle mounted in the hollow cavity and fixed through its ends on the bottom rail and the gear housing is fixed on the top rail.

17. The drive according to claim 16, wherein the gear housing is mounted in a U-shaped gear socket of a holder with arms for fixing the gear assembly on the top rail.

18. The drive according to claim 17, wherein the arms of the holder extend over the entire length of the top rail and have fastening openings which correspond to fastening openings of the top rail so that the holder can be connected to the top rail and reinforces same.

19. The drive according to claim 18 wherein the fastening openings of the holder are fastening elements with internal threads which project into the hollow cavity.

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20. (Previously Amended) The drive according to claim 18, wherein the gear assembly and gear housing are assembled as a unit located in the holder, and in the hollow cavity of the guide rail assembly and screwed to the top rail through the fastening openings.

21. The drive according to claim 16, wherein the holder has end areas which are angled so that they substantially fill out the free cross-sectional area of one of the top rail and the bottom rail.

22. The drive according to claim 17, further comprising uncoupling elements of one of rubber and plastic are mounted to eliminate noise and compensate for tolerances between the gear assembly and the arms of the gear socket of the holder.

23. (Previously Amended) The drive according to claim 17, further comprising ideal deformation points between the gear socket and the arms of the holder so that when a predetermined maximum boundary strain is exceeded the gear socket swivels sideways and clamps the threaded spindle.

24. The drive according to claim 1, wherein the ends of the spindle are mounted in vibration-damping sleeves to eliminate noise.

25. (Previously Amended) The drive according to claim 1 for use with a window lifter, wherein the two relatively displaceable parts are a vehicle door and a window pane, the one of the fixed spindle and the fixed toothed rack is a spindle fixed on the vehicle door so that the spindle points in the direction of movement of the window pane, the gear assembly is connected to the spindle and is connected to the lower edge of the window pane.

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26. (Previously Amended) The drive according to claim 1, wherein one of a spindle and a worm drive is a constituent part of an adjustment device for adjusting one of a seat height, seat incline, seat cushion depth, head restraint or backrest.

27. (Currently Amended) A method for assembling a gear housing for a drive for adjusting devices in motor vehicles comprising:

a) providing one of a fixed spindle and a fixed toothed rack fixed on one of two relatively displaceable parts;

a gear assembly mounted on the other of the two relatively displaceable parts; and

a gear housing holding the gear assembly, with the gear housing having at least two housing plates which can be fixed against each other by plug-in connectors;

each plug-in connector comprising a plug at one of the at least two housing plates and a receptacle for the plug at the other of the at least two housing plates, and [the] each plug-in connector is connected by plugging the plug into [the] a respective one of the receptacles;

wherein the plug-in connectors are formed sufficiently rigid to fix the at least two housing plates relative to each other in all three-dimensional directions and [thereby] to form supporting connecting joints which absorb [the] gear forces, and

wherein the at least two housing plates are fixed relative to each other solely at the plug-in connections;

b) prefitting gear elements of the gear assembly and the housing plates by fitting the housing plates together with the plug-in connections to form the gear housing with supporting connecting joints that absorb gear forces;

c) inserting the gear elements and the housing plates into a device which holds the housing plates with sufficiently light holding forces around the outer contour so that the housing plates can be aligned when the gear elements are turned,

d) turning the gear elements for the purpose of aligning bearing points of the gear elements which are provided on the housing plates; and

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e) after alignment, securing the position of the gear elements and housing plates relative to each other by increasing the holding forces and permanently fixing the position of the housing plates in all three-dimensional directions through action on the plug-in connectors.

28. The method for assembling a gear housing according to claim 27, wherein the gear elements are turned about at least 360° and are then held in this position and fixed.

29. (Previously Amended) The method for assembling a gear housing according to claim 27, wherein the gear elements are driven at a speed which is above their nominal speed and the position of the housing plates are fixed relative to each other during rotation of the gear elements.

30. (Previously Amended) The method for assembling a gear housing according to claim 27, wherein the fixing of the housing plates is produced by staking material in the area of the plug-in connectors, but outside of the area of bearing bores for the gear elements.

31. (Previously Amended) The method for assembling a gear housing according to claim 27, wherein the fixing of the housing plates is undertaken by one of laser welding and casting the plug-in connectors.

32. (Previously Amended) The method for assembling a gear housing according to claim 27, wherein the fixing of the housing plates is carried out by sticking the plug-in connectors.

33. The method for assembling a gear housing according to claim 27, wherein holding the outer contour of the housing plates, turning the gear elements and fixing of the housing plates are carried out in one combined assembly device.

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34. (Previously Amended) The drive according to claim 1:
wherein the one of the fixed spindle and the fixed toothed rack is a threaded spindle tensioned rotationally secure between two holders at its ends; and

the gear assembly comprises a spindle nut engaged with the spindle;

wherein the threaded spindle is fixed in at least one holder through an ideal break point and wherein one end of the threaded spindle has a positive locking element which can be connected to a rotating tool in order to overcome the ideal break point for the purpose of an emergency operation of the drive.

35. The spindle drive according to claim 34, wherein a threaded element with a groove as a material weakened area is welded to one of the holders and the threaded element is squashed through the material weakened area with the threaded spindle.

36. (Previously Amended) The spindle drive according to claim 35, wherein the threaded element has on a side remote from the holder a distance sleeve for defining a travel path of a top rail on a bottom rail.

37. The spindle drive according to claim 34, wherein one of the holders has a passage which is squashed with the threaded spindle at at least one place for holding the threaded spindle.

38. The spindle drive according to claim 34 further comprising a threaded element welded to one of the holders and a counter nut for fixing the position of the threaded spindle.

39. The spindle drive according to claim 34, wherein a nut which is held secured against rotation in positive locking engagement through a stop on one of the holders is welded to the threaded spindle at at least one spot so that the welding spot is the ideal break point.

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40. The spindle drive according to claim 34, further comprising an anti-rotation lock mounted securely against rotation on the threaded spindle and inserted with positive locking engagement into a threaded spindle receiving bore of a security plate, wherein the anti-rotation lock is destroyed during emergency operation of the threaded spindle.

41. The spindle drive according to claim 34, wherein a security plate fixes through a bracket the position of a nut which is mounted on the threaded spindle and secures the position of the threaded spindle.

42. The spindle drive according to claim 34, wherein a plastic security member is located in a threaded spindle receiving opening of each holder so that a circular round cross-section of each threaded spindle receiving opening remains secure and the width of the plastic security member is greater than the diameter of the threaded spindle receiving opening wherein in the case of an emergency operation the plastic security member can be removed and the threaded spindle can escape into the space which becomes available.

43. The drive according to claim 4, wherein each of the two pairs has two housing plates that are identical in design.